School of Social Science

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I hereby declare that the short synopsis" **Landuse Change and Food Security: A Geographical Study of Jhansi District** " being submitted in partial fulfillment of the requirement for the degree of Doctor of Philosophy in **Geography** under **School of Social Sciences** of U.P. Rajarshi Tandon Open University, Prayagraj during the academic year 2024-2025

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Landuse Change and Food Security: A Geographical Study of Jhansi District

SHORT SYNOPSIS

Submitted in partial fulfillment of the requirement of the degree of

DOCTOR OF PHILOSOPHY IN GEOGRAPHY

to

U.P.Rajarshi Tandon Open University, Prayagraj

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ABSTRACT

The study titled *"Landuse Change and Food Security: A Geographical Study of Jhansi District"* examines the dynamic relationship between land use transformations and food security in the Jhansi district of Uttar Pradesh, India. Over recent decades, shifts in agricultural practices, urban expansion, and infrastructural development have significantly impacted land utilization patterns. This research adopts a geographical perspective to analyze spatial and temporal changes in land use, correlating them with food production and accessibility metrics. Using satellite imagery, GIS mapping, and field surveys, the study assesses the implications of land conversion from agricultural to non-agricultural uses on local food security. The findings highlight critical areas where land use policies may threaten food sustainability, suggesting strategic planning to mitigate adverse effects. Enhanced land management and sustainable agricultural practices are recommended to safeguard food security in the face of ongoing urbanization and climate variability

Keywords:

Landuse Change, Food Security, Jhansi District, Geographical Study, Urbanization, Agricultural Practices, GIS Mapping, Sustainable Development.

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INTRODUCTION

Land is cherished asset on the earth surface. It is crucial in shaping human economic endeavors as well as advancing social and cultural development. All agricultural, animal and forestry depend on the quality and productivity of land. The entire terrestrial ecosystem consists of soil, water plant that survived on land resources. It meet the demand for food, energy and other needs of livelihood.

Land use refers to the various ways in which land is utilized, managed and modified by human activities. It encompasses a wide range of purposes including residential, commercial, industrial, agricultural and recreational uses. The general land use of a region is the end product of physical, economical and social factors. These elements have a crucial impact on determining the pattern of land use.

The general land use of a region is the end product of physical, economic and social factors. The way land is utilized is greatly influenced by these factors. This pattern of land use illustrates the nature of the relationship between humans and their environment.

The swiftly increasing population places a strain on the land, leading to a notable imbalance between the number of people and the available land. The changing land use pattern of a area or region also has a consequential effects on food production and its accessibility of that area. Food Availability, Food Accessibility, Food Utilization, Food Security are four main pillars of food security.

Availability

The 1st dimension is the accessibility. The Thomas Malthus hypothesis in 1798 anticipated that the populace development would unavoidably surpass

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the nourishment generation. This hypothesis had gigantic affect on our considerations till 1950s. But the accessibility of nourishment is expanded amid the final 50 a long time or so, the agrarian generation has intensified quickly due to insurgency in innovation, HYSs, fertilizers and pesticides. So, our nourishment adjust not falls down towards populace but it has remained excess till presently. Nourishment adjust sheet is key device to degree nourishment accessibility. A nourishment adjust sheet depicts all the factors which can constitute the overall accessibility of nourishment in a particular nation or zone over a chosen 12 month period.

Accessibility

Access is the second aspect of food security. The WFS definition states that it is important to "have physical, economic, and social access. "Even so, Amartya Sen introduced the idea of food access in the early 1980s. Access to food is influenced by three factors: sociocultural, financial, and physical. In actuality, the physical component is nearly a logistical one. A scenario in which food is produced in one country or region but in another with little to no transportation infrastructure connecting the two and no information issued as an example. Food is accessible where people (households, etc.) truly need it under a state of food security.

The World Foodt Program defines the economic component of food access. In the history of food security, the realization that the availability of food commodities but their inability to be afforded by individuals would define a condition of food insecurity is still relatively new. According to the WFS definition, "social" or socio-cultural access to food is the final componentoffoodaccess.Accordingtothis,foodcommoditiesmaybephysicallyac cessibleto consumers who possess the necessary funds to purchase them, but sociocultural barriers may restrict access to food, especially for certain demographic groups due to social or gender-related factors.

The Dimension of Utilization:

Food use is the third aspect of food security. The availability and

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accessibility of food in families is insufficient to ensure that people would eat a "safe and nutritious" diet. Based on their diet, each person has a unique nutritional status. The physiological state of an individual that results from the interaction between nutrient requirements, intake, and the body's capacity to absorb, digest, and use these nutrients is referred to as nutritional status.

Nutrients are essential for energy, growth body repair and disease prevention. An individual's requirement differ based on factors like age, height, gender, physical activity level, weight, life stage and overall health. Additionally access to clean water, proper sanitation and healthcare is closely connected to food intake.

Therefore, this aspect goes beyond nutrition to include food utilization, prevention, processing and preparation.

The Stability:

Stability is the fourth key dimension of food security, as highlighted in the World Food Summit (WFS) definition through the phrases "at all time". It emphasizes the consistent availability and access to food, building on the stability of the other three dimensions. Food security is along term challenge rooted in sustainability. The duration of food insecurity divides it into two main types under the stability aspect. Chronic food insecurity results from long term poverty, lack of assets and insufficient financial resources, leading to a continuous inability to meet basic dietary needs. In contrast, transitory food insecurity is a short term issue caused by sudden disruptions such as inflation, droughts or other unexpected events.

To put it simply, it is the availability and accessibility of an adequate amount of food grains to all people without any problems or worries. It is a state in which an individual satisfies his fundamental nutritional needs as well as other living necessities to become active and healthy.

The ZERO HUNGER CHALLENGE was introduced by the UN Secretary General in 2012 at the Rio+20 World Conference on Sustainable Development. It was started with the goal of igniting a global movement to

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eradicate hunger within a generation.

Decisions on land use have a direct impact on food security since they affect agricultural yields, water availability, and ecosystem health in general. Conversely, sustainable land management techniques have the potential to improve regional food security while protecting the environment. Land conversion for urbanization, industry, or agriculture can negatively impact biodiversity, soil fertility, and water resources.

The relevance of the research proposal on changing land use and food security in Jhansi district is that it will investigate the complex relationship between land usage patterns and food security, with the goal of creating strategies that maximize land utilization to improve food production distribution and overall security. Additionally, the study will help the agricultural system in the area become more resilient and adaptable.

LITERATURE REVIEW:

The consistent and finite resource is land. Human civilization has become entirely reliant on the use of land. The foundation of all forms of development in emerging nations like India is agricultural development. The significance of studying land usage is rapidly growing everyday. Several geographers have conducted noteworthy research on food security and land use.

The trace of brief history of land use was studied by O.B. Baker in 1927 and this was the phase when he 1st brought the land use survey into limelight. Later professor. L.D. Stamp in 1930 did intensive and nationwide land utilization survey of United kingdom which was based on the ordinance survey map. It stands as an enormous and significance stride forward for development and importance of land use pattern.

In 2001, Singh R.B. investigated the diversification of land use, agriculture, and agroforestry in Northwest India. He demonstrated that land use represents a combination of physical, chemical, and biological systems

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and processes, alongside human and societal behaviors and processes.

Rana V.P. analyzed the patterns of agricultural productivity in Bihar, employing a spatio-temporal analysis and the ranking coefficient method. His study revealed significant variations of agricultural productivity from 1990 to 1998, with high productivity areas situated in the south-central region of the state.

Carr, D.L. in his research explored how population growth, agricultural landuse and environmental conditions were interconnected in Latin America during early 20th century. He provided evidence of these interrelationships at regional, national and local levels, examining how shifts in population, farming practices and environmental factors affected one another across the region.

Lambin, E.F.(2001)- provides a comprehensive analysis of the drivers and consequences of landuse changes arould the world, a landmark study on the subject that highlights the importance of socioeconomic and environmental factors.

The study by Chhabra, A. (2002) examines how landuse changes in India impact agricultural production and carbon sequestration, emphasizing the variations observed across different regions.

Foley, J.A. (2005)– Explores the global impacts of landuse changes on ecosystems and food security , emphasizing the balance that must be struck between expanding agriculture and maintaining environmental sustainability.

Turner, B.L.(2007) –The study discusses how urbanization and agricultural intensification impact food production and examines the connection between changes in landuse and the availability of food in developing nations.

Godfray, H.C.J. (2010) In order to secure food security, the writers examine the difficulties of feeding the world's expanding population, highlighting the necessity of sustainable land use methods.

Ellis, E.C. (2013)– examines the ways in which human action has altered the

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Earth's land surface and Assesses how these changes have affected both food production and environmental stability.

Seto, K.C., Reenberg, A., & Boone, C.G. (2012)- The study looks at how land usage and food security are affected by urbanization, especially in fast emerging nations.

Ramankutty, N. (2018)–Explores the shift from traditional to commercial agriculture, its effects on food security in this global review of changes in agricultural land use.

Tilman, D. (2011)-The authors emphasize the importance of adopting sustainable farming methods as they examine the upcoming challenges to food security caused by global changes in land use.

Verburg, P.H. (2019)– Emphasized the importance of landuse modelling in predicting future food security trends under varying socio economic and environmental scenarios.

Jha, P. & Tripathi, S. (2011)-This study examines India's food security issues while taking the effects of changing land use brought on by industrialization and urbanization into account.

Ramachandra, T.V. & Kumar, U. (2008)– Used RS to analyze landuse changes in India and investigate their impacts on agricultural output and food availability.

Kumar, P. (2012)- focused on how changes in landuse affect rural livelihood in India, specifically highlighting the challenges faced by smallholder farmers and the implications For food security.

Ghosh, S. (2013)– investigates the challenges of food security in India, considering the imoacts of landuse changes driven by industrialization and urbanization.

Sarkar, A. & Chaudhuri, A. (2016)-With an emphasis on underserved people and their food security, the study examines the socioeconomic effects of landuse changes in India.

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Kumar, A. & Singh, N.P. (2014)-With suggestions for sustainable land management, this study examines the policy ramifications of land use changes for India's food security.

The significance of land as a limited resource for the majority of human endeavors, such as forestry, agriculture, industry, energy generation, settlement, water storage, and catchments, is also reflected in land. Land usage, which is primarily centered on specific goals, is a process of using the landscape and is limited by natural features and constraints.

Food security, according to Maxwell and Frakenberger (1992), is defined as having safe access to enough food at all times. The four fundamental ideas in their definitions were (1) sufficiency, (2) temporal consideration, (3) access, and (4) security.

The 2013 call for proposals aimed to rapidly advance knowledge to support innovations and decisions for sustainable land use that enhance food security and protect the environment.

Shallen J. (2016) Pointed out that India's current food crisis is driven more by challenges in food distribution than by the need to increase production or availability. The country faces numerous barriers to achieving food security, including natural disasters like droughts and heavy rainfall, limited irrigation water, soil erosion, uneven terrain and various problematic soil types such as degraded, infertile, acidic and alkaline soils. Additionally challenges include underdeveloped agricultural infrastructure, rapid population growth and limited access to education and employment opportunities.

STUDY AREA

Jhansi district located in the Northern Indian state of Uttar Pradesh, with the city of Jhansi serving as the administrative headquater of the Jhansi division. Up to eight districts from Madhya Pradesh and Uttar Pradesh encircle it. Four districts of Madhya Pradesh shares the boundary with the

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study area. Jalaun district shares the northern region, while Hamirpur district is located to the east, Lalitpur in the south-west, and Mahoba in the south-east. Uttar Pradesh covers a total geographical area of 2,40,928 kilometer per square. Jhansi is situated between latitudes 24°11'N and 25°57'N and longitudes 78°10'E to 79°25'E. As per the census Jansi district had a population of 1,998,603 ranking it 47th in the state. The district covers an area of 5,024 square kilometers and has population density about 400 person per square kms.

East to West distance of the district is 99 kms and North to South distance is 88 kms. There are eight development blocks and five tehsils, the district exhibits two different physical units: In contrast, the landscape is more mountainous and rocky in the south, with 1. The area comprises relatively flat, low lying, and fertile plains 2. the outer scarps of the Vindhayan and gneissic hills.

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OBJECTIVES OF THE RESEARCH

Research objectives are broad statements that define the main aim of the study. They are further broken down into specific, measurable and time bound tasks or steps that outline what needs to be done to successfully achieve the overall purpose of the research.

The research objectives are as follows:

1. To analyze the pattern of landuse cover and the landuse Change over time.
2. To assess how land use changes affect agricultural productivity by examining variations in crop yield, cultivated land area and crop diversity through field survey.
3. To evaluate the levels of food security in Jhansi district by analyzing food availability, accessibility and absorption.
4. To examine the impact of the Public Distribution System and other food entitlement programs on the region food security.
5. To develop the effective measures that optimize land utilization to enhance food production distribution and overall security.

RESEARCH METHODOLOGY:

This research is an analytical research. Both primary and secondary sources data will be used to achieve the objectives of research. Field interaction, field survey method will be used and different sources from government agencies, local authorities like SOI(survey of India),district statistical reports, census report, gazetter reports from planning offices, review of legal documents, the policy initiatives, plans and programs related to the food security and food issues. Whereas use of geospatial techniques is to be used for showing changes in landuse pattern. Statistical and mathematical methods such as correlation, regression analysis, factor analysis, central tendencies, chi square method and sampling methods will be used for data analysis.

EXPECTED OUTCOMES OF THE RESEARCH:

- The changes in landuse of the district Jhansi are primarily driven by urbanization,
- industrial development and infrastructural expansion which leads to reduction in agricultural field.

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- The reduction in land related to agriculture is because of land use changes which leads to decline in agricultural productivity and food production in Jhansi district.
- Land use changes have disproportionately affected marginalized and vulnerable groups in Jhansi district, exacerbating food insecurity among these population.
- Sustainable land use planning and policy intervention can mitigate the impacts of negative changes on food security because of landuse changes.

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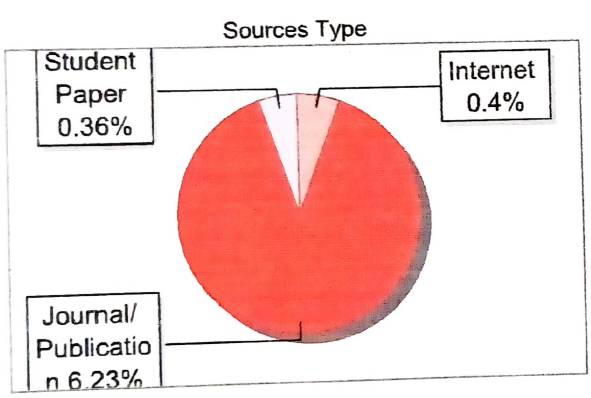

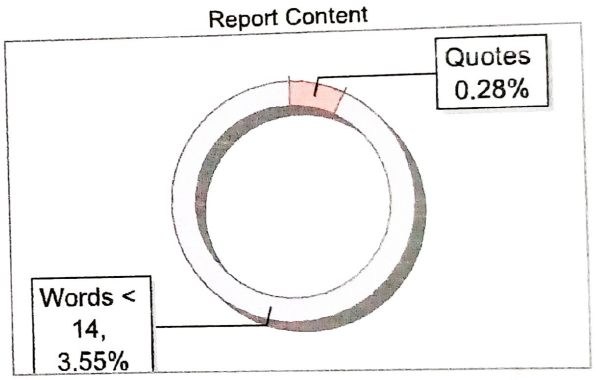

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